

On the biology of some species of Papilionidae from the island of Celebes (East-Indonesia)

by

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The island of Celebes is known for its numerous and endemic Lepidoptera. Unfortunately many habitats have been and are being destroyed because of total deforestation. Large areas stretching between Makassar and the Northern and Central Districts are covered with lalang (kunai grass) with only odd trees or small, secondary growth in some gullies. Although the Department of Forestry tries to control reckless cutting of forest and trees, there is little or no progress, mainly because of the indifferent or hostile attitude of the local population.

The author collected in Celebes during the year 1966 and found that Lepidoptera are still abundant in the restricted areas in the South such as Bantimurung (Waterfall of Maros) and locally on the Lompoh-Batang (Peak of Bonthain). The most interesting region stretches from East and South of Palu (Central Celebes) to areas around Lake Posso.

The life-histories of the following species of Papilionidae were recorded:

Troides hypolites Cramer

The early stages were common during the months December to May becoming rarer to nearly absent during the remaining months. Its favorite habitats are areas along rivers and creeks where the hostplant *Aristolochia tagala* Chan grows abundantly.

The egg is pearly gray and slightly flattened at the base. It is deposited singly on young shoots of the foodplant. The incubation period is from 8 to 9 days.

The 1st instar larva has a black ground color without markings. It has long and fleshy tubercles without spines. Tubercles are black with faint red tips with the exception of the dorsal ones of the 4th abdominal segment which are pale orange.

In the 2nd to the 4th instars the ground color remains the same. A yellowish white lateral stripe extends from the base of the dorsal tubercles of the 4th abdominal to the prolegs of the 3rd abdominal segment. The tubercles are long and black and with red tips. In the 2nd and 3rd instars the dorsal tubercles of the 4th and the lateral ones of the 3rd abdominal segments are pinkish white with pink tips becoming white with light red tips in the 4th instar. From the 2nd abdominal segment onward the dorsal tubercles have cephalad inclined tips.

In the 5th instar the ground color is reddish-black. The saddle mark is broad and white. Between the dorsal tubercles of the 3rd abdominal segment is a short white transverse stripe. All the tubercles are long with a broad base, they are black with rounded, red tips, inclined cephalad. The dorsal tubercles of the 4th and the lateral ones of the 3rd abdominal segments are white with light red tips. The head, the neckshield and legs are black, the osmaterium is orange-yellow. Measure-

ments of a large larva, which produced a ♀, were: length 92 mm, greatest width 22 mm, headcapsule: length 7.5 mm and width 6.6 mm.

As is generally the case in *Troides*, pupation takes place on twigs or small branches of a tree or shrub growing in the vicinity of the hostplant. The pupa has a pinkish-gray ground color, strongly mottled with fine, dark irregular markings. The wingcases are very broad as is the orange-yellow dorsal saddle-mark. The abdominal segments 6 to 8 carry two dorsal processes each. Those on the 6th segment are short and pointed. On the 7th segment they are long, blunt and inclined caudad and on the following abdominal segment the processes are also long and blunt but inclined laterally. The pupal stage ranges from 29 to 31 days. No predators have been observed.

The imagos appear to prefer open but shady places. During the warmest hours of the day they were seen resting on leaves of shrubs and trees. The males rest with folded wings while the females keep the wings spread. When the weather is cloudy the butterflies are active throughout the day.

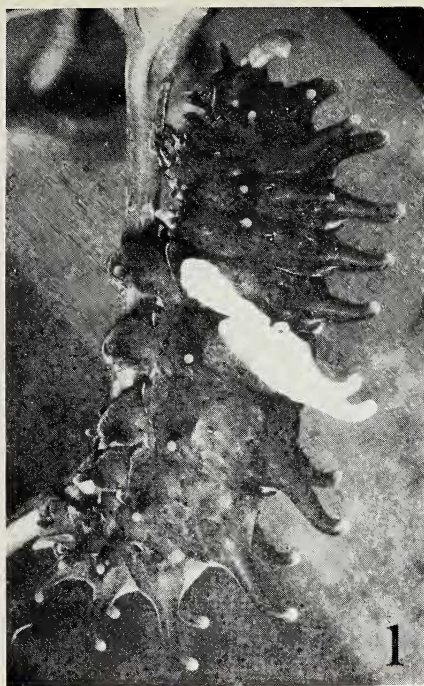
Troides helena hephaestes Fldr.

This is the commonest of the *Troides* species which occur in Celebes. It is found in the hot, coastal plains up to elevations of 1700 meters or more. The egg is a yellowish gray, and small in size for this species. It is singly deposited on the hostplant, *Aristolochia tagala*. The number of eggs laid on a single plant depends on its size and location. The incubation period is from 8 to 9 days.

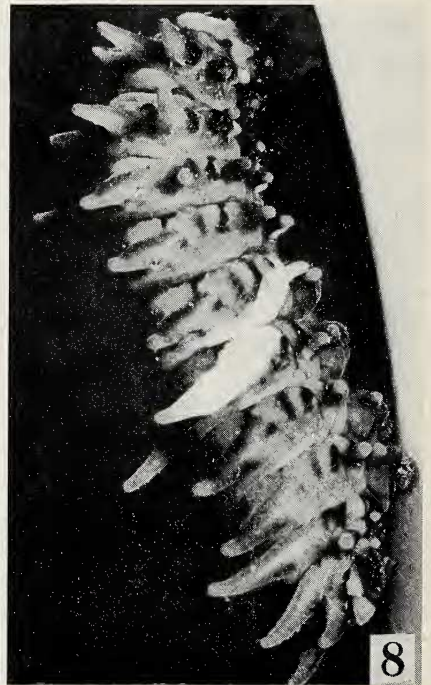
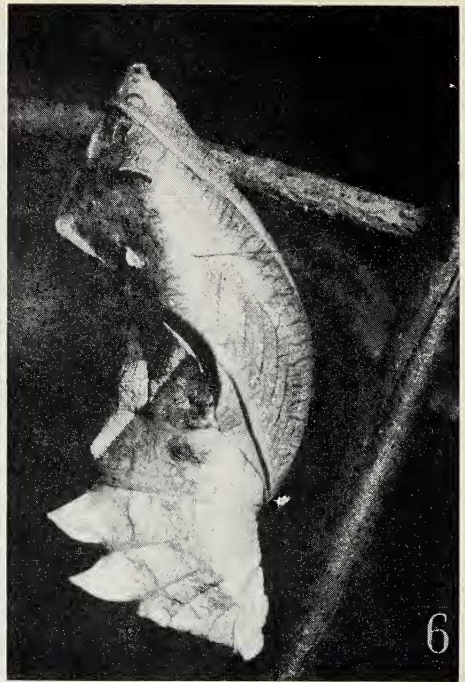
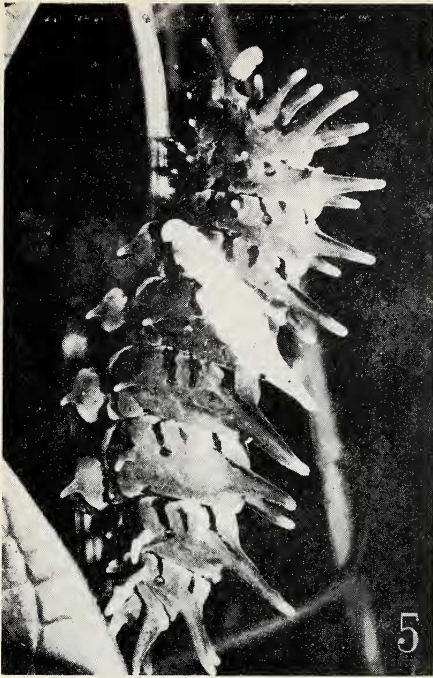
The 1st instar larva has a velvety-black ground color without markings. The 4th abdominal segment has a narrow, faint lateral stripe. The tubercles are fleshy without spines, black with pinkish-yellow tips. The lateral tubercles of the thoracic segments are the longest.

In the 2nd to 4th instars the ground color grows gradually paler. The tubercles of the thoracic segments and those of the 7th to the last abdominal segments are dark pinkish with light red tips, the dorsal tubercles of the 4th and the lateral ones of the 3rd abdominal segments are white with pink tips, the remaining tubercles are as the ground color with yellowish tips. In the 4th instar the white lateral saddle-mark extends from the base of the dorsal tubercles of the 4th down to the spiracles of the 3rd abdominal segment. The pinkish-gray ground color is marked with short, irregular black stripes.

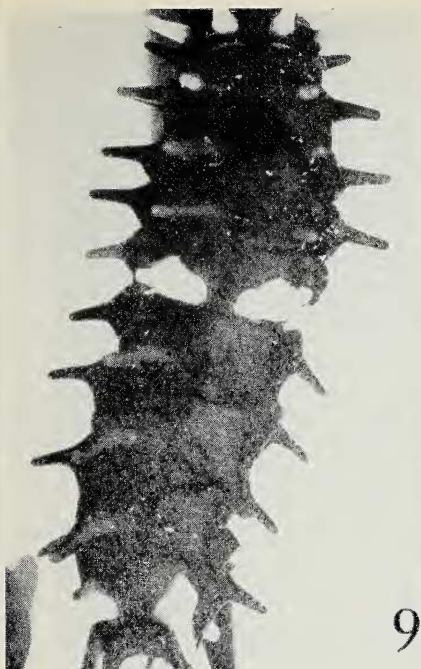
In the 5th instar the ground color is light ochreous brown to pale yellowish grey, and slightly pinkish. Laterally each abdominal segment has 2 long and 2 short narrow, black oblique stripes running cephalad. The longest stripes run from the tip of the dorsal tubercles down to the segmental juncture, the short stripes commence about halfway each segment and stretch as far as its juncture with the following segment. The tubercles are long and straight, the dorsal ones the longest. Their color is pale ochreous with light red tips, the lateral tubercles are darker. The saddle-mark is conspicuous, broad and white. The juncture of the 3rd abdominal segment is white dorsally. The osmaterium is yellow. Measurements of a mature larva were: length 89 mm, greatest width 20 mm, longest dorsal tubercle 12 mm, headcapsule: length 6.8 mm, width 5.9 mm. Pupation occurs on twigs



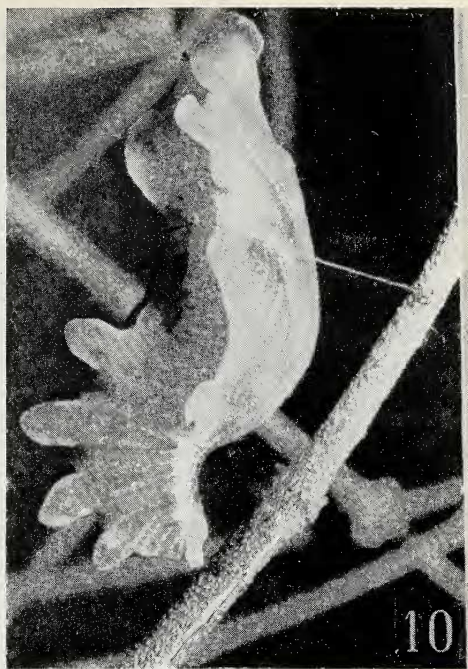
Troides hypolites Cramer. 1, larva, lateral; 2, pupa, lateral; 3, pupa, dorsal; 4, imago (male), emerged. Figs. 1—3 about natural size, fig. 4 about $\frac{1}{2}$ \times .



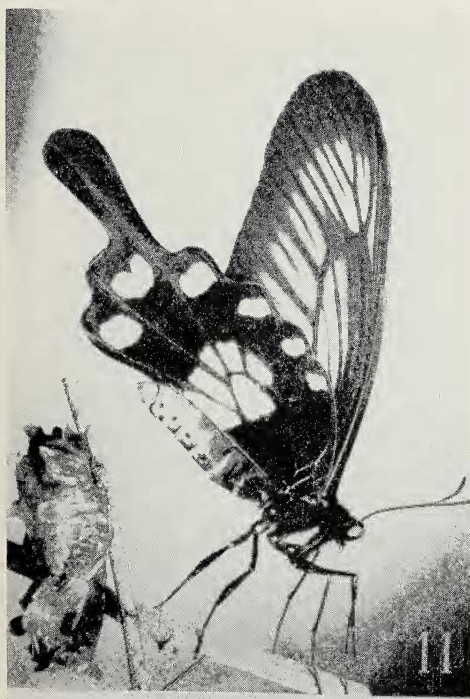
Troides belena hephaestes Felder. 5. mature larva; 6. pupa, lateral. *Troides belena papuensis* Wall. 7. pupa; 8. larva, 5th instar, Lae, June 1963. Fig. 5. slightly reduced, 6 about nat. size, figs. 7 and 8 about $1\frac{1}{2} \times$.



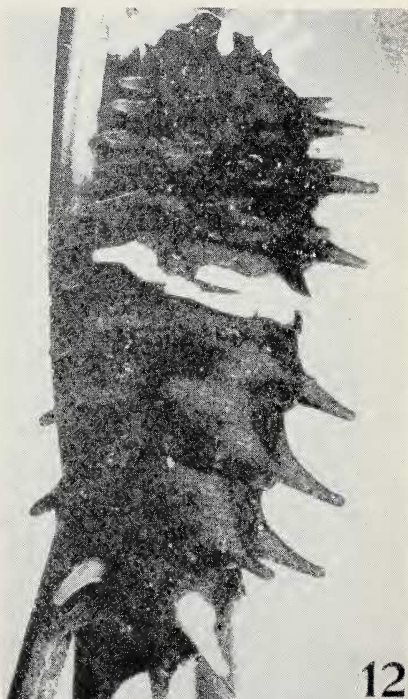
9



10



11



12

Atrophaneura polyphontes Bsd. 9. larva, dorsal; 10. pupa, lateral; 11. imago, emerged; 12. larva, lateral. Figs. 9, 10 and 12 $2\frac{1}{2}$ X, fig. 11 slightly reduced.